

WHAT IS CLAIMED IS:

1. A process cartridge adapted to be detachably attached to a body of an image forming apparatus, comprising:

5        an image bearing member;

         developing means for developing an electrostatic image formed on said image bearing member by using developer to form a developer image on said image bearing member; and

10        developer charging means for charging residual developer on said image bearing member disposed downstream, with respect to a moving direction of said image bearing member, of a transferring position at which said developer image is transferred onto a  
15        transfer destination member and upstream, with respect to the moving direction of said image bearing member, of a position at which the electrostatic image is formed on said image bearing member, said developer charging means being disposed in such a way  
20        that it can be in contact with said image bearing member, and said developer charging means being movable in a direction substantially the same as a longitudinal direction of said image bearing member upon charging said residual developer;

25        wherein in the direction substantially the same as the longitudinal direction of said image bearing member, letting  $L_1$  (mm) be a developing width of said

developing means, letting  $L_2$  (mm) be a contact width  
of said developer charging means with said image  
bearing member, and letting  $d$  (mm) be a width of  
movement of said developer charging means, the  
5 following condition is satisfied:

$$L_1 + d \leq L_2.$$

2. A process cartridge according to claim 1,  
further comprising a charging device that charges  
10 said image bearing member for allowing formation of  
said electrostatic image, wherein letting  $L_3$  (mm) be  
a charging width of said charging device in the  
direction substantially the same as the longitudinal  
direction of said image bearing member, the following  
15 condition is satisfied:

$$L_1 + 2d \leq L_3.$$

3. A process cartridge according to claim 1,  
wherein said body of the apparatus has transferring  
20 means for transferring said developer image onto said  
transfer destination member at said transferring  
position, and wherein letting  $L_4$  (mm) be a  
transferring width of said transferring means in the  
direction substantially the same as the longitudinal  
25 direction of said image bearing member, the following  
condition is satisfied:

$$L_1 + 2d \leq L_4.$$

4. A process cartridge according to claim 1,  
wherein letting L5 (mm) be a length of chargeable  
portion of said image bearing member in the direction  
5 substantially the same as the longitudinal direction  
of said image bearing member, the following condition  
is satisfied:

$$L2 \leq L5 - d.$$

10 5. A process cartridge according to claim 2,  
wherein letting L5 (mm) be a length of a chargeable  
portion of said image bearing member in the direction  
substantially the same as the longitudinal direction  
of the image bearing member, the following condition  
15 is satisfied:

$$L3 \leq L5.$$

6. A process cartridge according to claim 1,  
wherein said body of the apparatus has transferring  
20 means for transferring said developer image onto said  
transfer destination member at said transferring  
position and cleaning means for removing developer on  
said transfer destination member, and wherein letting  
L6 (mm) be a cleaning width of said cleaning means in  
25 the direction substantially the same as the  
longitudinal direction of the image bearing member,  
the following condition is satisfied:

$$L1 + 2d \leq L6.$$

7. A process cartridge according to claim 1,  
wherein upon charging said residual developer, said  
5 developer charging means can reciprocate in the  
direction substantially the same as the longitudinal  
direction of said image bearing member.

8. A process cartridge according to claim 1,  
10 wherein a DC voltage having charge polarity same as  
normal charge polarity of the developer is applied to  
said developer charging means.

9. A process cartridge according to claim 1,  
15 wherein said developer charging means has a fiber  
brush portion that is in contact with said image  
bearing member.

10. A process cartridge according to claim 1,  
20 wherein said developing means is capable of  
recovering residual developer on said image bearing  
member.

11. A process cartridge according to claim 1,  
25 wherein said charging device is disposed in contact  
with said image bearing member.

12. A process cartridge according to claim 1 or 2, wherein an oscillating voltage is applied to said charging device.

5           13. A process cartridge according to claim 12, wherein said charging device reduces a charge amount of developer remaining on said image bearing member.

10           14. A process cartridge according to claim 1, further comprising second developer charging means for charging residual developer on said image bearing member with charge polarity reverse to normal charge polarity of developer that is disposed downstream, with respect to the moving direction of said image bearing member, of said transferring position and upstream, with respect to the moving direction of said image bearing member, of said developer charging means, said second developer charging means being disposed in such a way that it can be in contact with  
15           said image bearing member, and said second developer charging means being movable in the direction substantially the same as a longitudinal direction of said image bearing member.  
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25           15. A process cartridge according to claim 14, wherein said second developer charging means is capable of reciprocating in the direction

substantially the same as the longitudinal direction of the image bearing member.

16. A process cartridge according to claim 14,  
5 wherein said second developer charging means has a fiber brush portion that is in contact with said image bearing member.

17. A process cartridge according to claim 14,  
10 wherein a contact width of said second developer charging means and said image bearing member is substantially the same as a contact width of said developer charging means and said image bearing member in the direction substantially the same as the  
15 longitudinal direction of said image bearing member, and a width of movement of said second developer charging means is substantially the same as the width of movement of said developer charging means..

20 18. An image forming apparatus comprising:  
an image bearing member  
developing means for developing an electrostatic image formed on said image bearing member by using developer to form a developer image on said image  
25 bearing member; and  
developer charging means for charging residual developer on said image bearing member disposed

downstream, with respect to a moving direction of  
said image bearing member, of a transferring position  
at which said developer image is transferred onto a  
transfer destination member and upstream, with  
5 respect to the moving direction of said image bearing  
member, of a position at which the electrostatic  
image is formed on said image bearing member, said  
developer charging means being disposed in such a way  
that it can be in contact with said image bearing  
10 member, and said developer charging means being  
movable in a direction substantially the same as a  
longitudinal direction of said image bearing member  
upon charging said residual developer;

wherein in the direction substantially the same  
15 as the longitudinal direction of said image bearing  
member, letting  $L1$  (mm) be a developing width of said  
developing means, letting  $L2$  (mm) be a contact width  
of said developer charging means with said image  
bearing member, and letting  $d$  (mm) be a width of  
20 movement of said developer charging means, the  
following condition is satisfied:

$$L1 + d \leq L2.$$

19. An image forming apparatus according claim  
25 18, further comprising a charging device that charges  
said image bearing member for allowing formation of  
said electrostatic image, wherein letting  $L3$  (mm) be

a charging width of said charging device in the direction substantially the same as the longitudinal direction of said image bearing member, the following condition is satisfied:

5 
$$L1 + 2d \leq L3.$$

20. An image forming apparatus according to claim 18 further comprising transferring means for transferring said developer image onto said transfer  
10 destination member at said transferring position, wherein letting  $L4$  (mm) be a transferring width of said transferring means in the direction substantially the same as the longitudinal direction of said image bearing member, the following condition  
15 is satisfied:

$$L1 + 2d \leq L4.$$

21. An image forming apparatus according to claim 18, wherein letting  $L5$  (mm) be a length of  
20 chargeable portion of said image bearing member in the direction substantially the same as the longitudinal direction of said image bearing member, the following condition is satisfied:

$$L2 \leq L5 - d.$$

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22. An image forming apparatus according to claim 19, wherein letting  $L5$  (mm) be a length of a



chargeable portion of said image bearing member in the direction substantially the same as the longitudinal direction of the image bearing member, the following condition is satisfied:

5            $L3 \leq L5.$

23. An image forming apparatus according to claim 18 further comprising transferring means for transferring said developer image onto said transfer destination member at said transferring position and  
10 cleaning means for removing developer on said transfer destination member, wherein letting  $L6$  (mm) be a cleaning width of said cleaning means in the direction substantially the same as the longitudinal  
15 direction of the image bearing member, the following condition is satisfied:

$$L1 + 2d \leq L6.$$

24. An image forming apparatus according to  
20 claim 18 further comprising a carrying member for carrying said transfer destination member and conveying it to said transferring position, transferring means for transferring said developer image onto said transfer destination member at said  
25 transferring position and cleaning means for removing developer on said image bearing member, wherein letting  $L6$  (mm) be a cleaning width of said cleaning

means in the direction substantially the same as the longitudinal direction of said image bearing member, the following condition is satisfied:

$$L1 + 2d \leq L6.$$

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25. An image forming apparatus according to claim 18, wherein upon charging said residual developer, said developer charging means can reciprocate in the direction substantially the same as the longitudinal direction of said image bearing member.

26. An image forming apparatus according to claim 18, wherein a DC voltage having charge polarity same as normal charge polarity of the developer is applied to said developer charging means.

27. An image forming apparatus according to claim 18, wherein said developer charging means has a fiber brush portion that is in contact with said image bearing member.

28. An image forming apparatus according to claim 18, wherein said developing means is capable of recovering residual developer on said image bearing member.

29. An image forming apparatus according to claim 18, wherein said charging device is disposed in contact with said image bearing member.

5           30. An image forming apparatus according to claim 18 or 19, wherein an oscillating voltage is applied to said charging device.

10           31. An image forming apparatus according to claim 30, wherein said charging device reduces a charge amount of developer remaining on said image bearing member.

15           32. An image forming apparatus according to claim 18, further comprising second developer charging means for charging residual developer on said image bearing member with charge polarity reverse to normal charge polarity of developer disposed downstream, with respect to the moving  
20           direction of said image bearing member, of said transferring position and upstream, with respect to the moving direction of said image bearing member, of said developer charging means, said second developer charging means being disposed in such a way that it  
25           can be in contact with said image bearing member, and said second developer charging means being movable in the direction substantially the same as a

longitudinal direction of said image bearing member.

33. An image forming apparatus according to  
claim 32, wherein said second developer charging  
5 means is capable of reciprocating in the direction  
substantially the same as the longitudinal direction  
of the image bearing member.

34. An image forming apparatus according to  
10 claim 32, wherein said second developer charging  
means has a fiber brush portion that is in contact  
with said image bearing member.

35. An image forming apparatus according to  
15 claim 32, wherein a contact width of said second  
developer charging means and said image bearing  
member is substantially the same as a contact width  
of said developer charging means and said image  
bearing member in the direction substantially the  
20 same as the longitudinal direction of said image  
bearing member, and a width of movement of said  
second developer charging means is substantially the  
same as the width of movement of said developer  
charging means.

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36. An image forming apparatus according to  
claim 18 provided with a plurality of image forming

stations each of which having said image bearing member, said developing means and said developer charging means, wherein developer images are transferred from the image bearing members of the  
5 respective image forming stations onto said transfer destination member that moves through the image forming stations.

37. An image forming apparatus according to  
10 claim 36, wherein said transfer destination member is an intermediate transferring member, and said developer images are transferred from said intermediate transferring member onto a transferring material.

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38. An image forming apparatus according to claim 36, wherein said transfer destination member is a transferring material, and a transferring material carrying member that carries the transferring  
20 material moves through said image forming stations.

39. An image forming apparatus according to claim 36, wherein said image forming stations form developer images of different colors on said transfer  
25 destination member respectively.